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10/522,774	09/29/2005	Masayuki Kamikawa	H&A-137	1626

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Mattingly Stanger Malur
Suite 370
1800 Diagonal Road
Alexandria, VA 22301

EXAMINER

NGUYEN, TU MINH

ART UNIT	PAPER NUMBER
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3748

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/522,774	Applicant(s) KAMIKAWA ET AL.	
	Examiner TU M. NGUYEN	Art Unit 3748	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 31 January 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-11 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-11 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 29 September 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>20050131</u> . | 6) <input type="checkbox"/> Other: _____ |

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DETAILED ACTION

1. An Applicant's Preliminary Amendment filed on January 31, 2005 has been entered. Claims 4-6, 9, and 10 have been amended. Overall, claims 1-11 are pending in this application.

Claim Objections

2. Claims 1 and 3 are objected to because of the following informalities:
- Claim 1, line 1 of the claim, "exh aust" should read --exhaust--.
 - Claim 3, line 3 of the claim, --hydrocarbon-- should be inserted following "burns".

Appropriate correction is required.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office Action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. **Claims 1, 4-9, and 11 are rejected under 35 U.S.C. 102(e) as being anticipated by Kitahara (PCT Publication No. WO 03/018972) (see U.S. Patent 6,796,118 for the English equivalence).**

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Re claims 1 and 11, as shown in Figure 1, Kitahara discloses an exhaust gas purifying apparatus and an exhaust gas purifying method for a diesel engine (1), the apparatus comprising:

- an NO_x adsorption and reduction type catalyst (13) that adsorbs and reduces NO_x in an exhaust gas; and

- a diesel particulate filter (14) that collects particulate matters in the exhaust gas from the upstream side of a flow of the exhaust gas,

wherein the catalyst (13) and filter (14) being arranged sequentially in an exhaust channel that exhausts the exhaust gas of the diesel engine.

Re claim 4, in the exhaust gas purifying apparatus of Kitahara, heating means (rich operation in step S13 or S15 of a routine in Figure 2) that heats the exhaust gas on the upstream side of the exhaust gas channel of the NO_x adsorption and reduction type catalyst.

Re claim 5, the exhaust gas purifying apparatus of Kitahara further comprises heating means (rich operation in step S19 of Figure 2) that heats the diesel particulate filter.

Re claims 6-8, from a routine illustrated in Figure 2, the exhaust gas purifying apparatus of Kitahara further comprises:

- NO_x amount estimation means (step S3) that estimates an amount of NO_x accumulated in the NO_x adsorption and reduction type catalyst from a measured value of a physical quantity that stands for an operation condition of the diesel engine such as temperature, an air-fuel ratio, oxygen concentration, and a lean operation time of an exhaust gas that flows into the NO_x adsorption catalyst (see lines 44-52 of column 4); and

- control means that, when the amount of accumulated NO_x estimated by the NO_x amount estimation means reaches a fixed value (step S10 with YES answer), performs control

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(step S13 or S15) of increasing the temperature of the exhaust gas that flows into the NO_x adsorption and reduction type catalyst to temperature necessary for NO_x reduction and purification, and supplying fuel that is a reducing agent necessary for reducing accumulated NO_x to the exhaust gas,

wherein the fuel that is a reducing agent necessary for reducing NO_x is supplied to the exhaust gas by increasing the amount of the fuel supplied to the diesel engine by means of a fuel secondary injection that injects the fuel (rich condition in premix combustion) to an engine combustion chamber in an expansion stroke of the diesel engine.

Re claim 9, as shown in Figures 2 and 4, the exhaust gas purifying apparatus of Kitahara further comprises:

- exhaust gas temperature measuring means (25) that measures the temperature of the exhaust gas that flows into the diesel particulate filter (14);

- exhaust gas temperature judgment means that judges the exhaust gas temperature measured by the exhaust gas temperature measuring means is lower than a predetermined temperature (step S28 with NO answer);

- particulate capture amount estimation means (step S5) that estimates an amount of particulates captured by the diesel particulate filter; and

- heating means (step S19) that heats the exhaust gas,

wherein control of heating the exhaust gas into the predetermined temperature (step S19) is performed by the heating means, and the particulates captured by the diesel particulate are burned and removed when an estimated value of the amount of particulates estimated by the particulate capture amount estimation means reaches a predetermined capture amount (step S18

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with YES answer), and the exhaust gas temperature is judged by the exhaust gas temperature judgment means to be lower temperature than the predetermined temperature (step S28 with NO answer).

5. Claims 1, 10, and 11 are rejected under 35 U.S.C. 102(e) as being anticipated by Deeba (U.S. Patent 6,912,847).

Re claims 1 and 11, as shown in Figure 2, Deeba discloses an exhaust gas purifying apparatus and an exhaust gas purifying method for a diesel engine, the apparatus comprising:

- an NO_x adsorption and reduction type catalyst (21) that adsorbs and reduces NO_x in an exhaust gas; and

- a diesel particulate filter (15) that collects particulate matters in the exhaust gas from the upstream side of a flow of the exhaust gas,

wherein the catalyst (21) and filter (15) being arranged sequentially in an exhaust channel that exhausts the exhaust gas of the diesel engine.

Re claim 10, in the exhaust gas purifying apparatus of Deeba, the NO_x adsorption and reduction type catalyst includes at least one type of element chosen from potassium, sodium, magnesium, strontium, and calcium (lines 55-57 of column 5), at least one type of element chosen from a rare earth metal such as cerium (lines 6-9 of column 7), at least one type of element chosen from precious metals such as platinum, rhodium, and palladium (lines 24-29 of column 7), and at least one type of an element chosen from titanium or silicon, and is a composite composed of a metal, metal oxides, or a compound oxide, or a composite in which the composite is carried in porous heat resistant metal oxides (see lines 3-10 of column 8).

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office Action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 2-3 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kitahara as applied to claim 1 above, in view of Stroia et al. (U.S. Patent 6,820,414).

Re claim 2, the exhaust gas purifying apparatus of Kitahara discloses the invention as cited above, however, fails to disclose that an oxidation catalyst is arranged on the downstream side of the diesel particulate filter viewed from the flow of the exhaust gas.

As shown in Figure 1, Stroia et al. disclose an after-treatment system having a soot filter (18) and a dual NO_x adsorbers (26, 28) arranged in parallel. As indicated on lines 9-17 of column 5, Stroia et al. teach that it is conventional in the art to utilize an oxidation catalyst (40) arranged on the downstream side of the soot filter and the NO_x adsorbers in order to remove unburned HC that slip through the NO_x adsorbers. It would have been obvious to one having ordinary skill in the art at the time of the invention was made, to have utilized the oxidation catalyst taught by Stroia et al. in the apparatus of Kitahara, since the use thereof would have been routinely practiced by those with ordinary skill in the art to prevent inadvertent release of harmful HC emissions into the atmosphere.

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Re claim 3, in the modified exhaust gas purifying apparatus of Kitahara, the oxidation catalyst (40) is a three-way catalyst that adsorbs NO_x in the exhaust gas, and is a hydrocarbon adsorption and combustion type catalyst that burns hydrocarbon and purifies the NO_x.

Prior Art

8. The IDS (PTO-1449) filed on January 31, 2005 has been considered. An initialized copy is attached hereto.

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure and consists of four patents: Murachi et al. (U.S. Patent 5,746,989), Khair et al. (U.S. Patent 6,293,096), Shigapov et al. (U.S. Patent 6,813,884), and Szymkowicz (U.S. Patent 6,915,629) further disclose a state of the art.

Communication

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Examiner Tu Nguyen whose telephone number is (571) 272-4862.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mr. Thomas E. Denion, can be reached on (571) 272-4859. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

TMN

September 14, 2008

/Tu M. Nguyen/

Tu M. Nguyen

Primary Examiner

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